

# Real-Time Noise Prediction of V/STOL Aircraft in Maneuvering Flight, Phase I

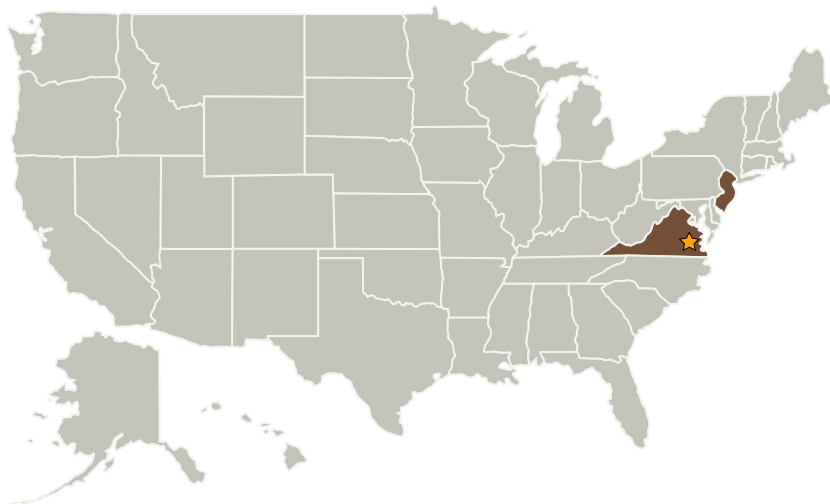
Completed Technology Project (2005 - 2005)



## Project Introduction

This proposal outlines a plan for enhancing and integrating new breakthrough technologies to provide accurate real-time noise prediction of V/STOL aircraft in maneuvering flight within a flight simulation environment. Loading, thickness and BVI noise sources, which often dominate the noise spectrum, will be predicted from first principles by coupling Continuum Dynamics, Inc.'s unique real-time full-span free-vortex wake model with Penn State University's innovative PSU-WOPWOP maneuvering flight noise prediction method. General rotorcraft configurations will be supported (e.g., tiltrotor, coaxial, tandem, main rotor/tail rotor) as well as ducted fan and powered lift aircraft. Other noise sources (e.g., broadband, engine, and self-noise) will be modeled using the most advanced empirical methods available today. Atmospheric absorption, spherical spreading, ground reflection, attenuation and acoustic phasing will be modeled through a direct coupling with Wyle Laboratory's state-of-the-art RNM code to provide accurate ground noise assessment required for low noise flight path planning. Further enhancements could lead to onboard flight management systems able to monitor and reduce ground noise levels in flight, a capability that would both improve public acceptance of V/STOL aircraft introduced into the National Airspace System and save the lives of military aviators operating rotorcraft in hostile territory.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Langley Research Center (LaRC)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Continuum Dynamics, Inc.	Supporting Organization	Industry	Ewing, New Jersey

## Primary U.S. Work Locations

New Jersey	Virginia
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Daniel Wachspress

## Technology Areas

**Primary:**

- TX15 Flight Vehicle Systems
  - └ TX15.1 Aerosciences
    - └ TX15.1.4 Aeroacoustics